Amendments to the Specification:

IN THE TITLE:

Please change the Title of the invention to:

--Method for Making Silicon Containing Dielectric Films--

[0011] At atmosphere and aggressive pyrogenic steam ambient, ~~(~~steam formed by reacting O_2 with H_2 at T>700°C, ~~)~~ SiC oxidizes slowly and only at temperatures above roughly 1,000°C. Under comparable conditions single crystal silicon oxidizes at a rate at least ~~10x~~ ten times faster. Forming ~~silicon thin films~~ silicon containing dielectric films such as SiO_2 on a substrate such as SiC at a lower temperature and with less time will be beneficial.

[0020] ~~More particularly, this~~The novel method of forming a thin silicon oxide film includes the steps of providing a silicon carbide substrate, passing an oxidizing gas through an oscillating radio frequency electric field ~~so~~ such that the gas achieves an excited state of energy, and ~~permitting~~guiding the excited gas ~~to contact~~so that said excited gas contacts the substrate held at a predetermined temperature. The inductive field may be created by using an afterglow thermal reactor ~~or~~containing a microwave cavity. The oxidizing gas is selected from the group consisting of molecular oxygen, atomic oxygen, excited molecular O_2 (singlet delta g state), and nitrogen oxides. Moreover, the oxidizing gas is maintained at a pressure less than 50 torr and the substrate in a temperature range between 600°C to 1,200°C ~~and at a pressure less than 50 torr~~. The pressure is maintained using a vacuum pump. The ~~silicon~~ substrate is ~~silicon or~~ silicon carbide and is secured onto a heated zone.

[0026] Referring now to Fig. 1, it will there be seen that an illustrative embodiment of the invention is ~~denoted as a whole by the reference numeral 10~~ depicted in diagrammatic form.

[0022] Another method of forming thin silicon oxide film includes the steps of providing a silicon carbide substrate within a tube so that the tube is in contact with a furnace and is connected to a pump. An oxidizing gas is passed through an afterglow thermal reactor so that the gas achieves an excited state of energy. Additionally, a secondary gas ~~was~~is added to the flow of excited gas ~~or~~eminating from the plasma ~~in order~~ to modify the gas chemistry such as to enhance the production of ground state oxygen, before contacting the substrate. The excited gas mixture

then is permitted to contact the substrate within the tube. The tube is maintained at a temperature between 600°C to 1,200°C and at a pressure less than 50 torr.

[0027] ~~The novel method incorporates an afterglow source and includes the steps of providing a silicon substrate 12 through a loading port 11 and placing it within tube 14 in contact with furnace 16, and connected to pump 18.~~ Silicon carbide substrate 6 is introduced into tube 9 through loading port 7. Furnace 8 encircles tube 9 so that the temperature within tube 9 may be controlled. Pump 10 is in fluid communication with tube 9 so that the pressure within tube 9 may be controlled. An oxidizing gas 1 is passed through an afterglow source ~~or~~such as a microwave cavity ~~22~~2 so that gas 1 achieves an excited state of energy ~~24~~3 or plasma phase ~~however, remaining electrically neutral~~ that upon its exit from said cavity is in a neutral state. ~~The electrically neutral excited gas 24~~ Afterglow species 5 then contacts substrate ~~12~~6 within tube ~~14~~9 which functions as an afterglow vessel. Furnace ~~16~~8 maintains tube ~~14~~9 and hence substrate 6 at a temperature between 600°C to 1,200°C and pump ~~18~~10 maintains said tube at a pressure less than 50 torr.

[0028] ~~Silicon~~More particularly, silicon carbide substrate ~~12~~6 is supported within fused silica tube ~~14~~9, or any appropriate vessel such that ions, electrons, and photons are excluded from the thermal region where the substrates are held. Silicon carbide substrate ~~12~~6 or ~~wafers~~wafer may be oxidized ~~or bare silicon carbide,~~ while mounted on a holder that supports substrate ~~12~~6. Substrate ~~12~~6, which is preferably silicon carbide, is placed in tube ~~14~~9 through load port ~~11~~7 as aforesaid. Furnace ~~16~~8 surrounds ~~the~~ afterglow vessel 9. ~~which also passes through a~~ A microwave glow discharge acts as a source of chemical species ~~30~~5 which flows within ~~tube 14~~ said afterglow vessel 9. The reference numeral 4 denotes a port of entry for a secondary gas that is added, upstream of substrate 6, to the flow of excited gas or plasma to modify the afterglow species chemistry for example to enhance the production of ground state oxygen.

[0031] As shown in Fig. 2, thin films ~~2 in~~ 12 are grown using only the materials of the single crystal substrates, ~~(~~silicon carbide, ~~or silicon)~~ and the chemical species 5 created by the glow discharge source that flow into the heated zone of the vacuum furnace where ~~the~~ substrates 6 are supported. A repeated thin film growth has been demonstrated at temperatures as low as 600°C on silicon carbide and silicon. In the afterglow chemical environment noted above, film thickness of 200Å is obtained in 2 hours at 800°C and 1 Torr total pressure. Silicon has also been

oxidized at the same time and temperature in the afterglow species chemistry ~~for~~ obtaining [illegible] roughly 200Å of film. The interior of tube 9 is maintained at a temperature between 600°C to [illegible] 1,200°C by ~~the~~ furnace 8, and at a pressure less than 50 torr ~~using the~~by pump 10.